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ASSESSMENT OF FLOODING
OF MUNICIPAL SEWAGE TREATMENT PLANTS
IN THE SUSQUEHANNA RIVER BASIN



SUSQUEHANNA RIVER BASIN COMMISSION

OCTOBER 13, 1977

The Susquehanna River Basin Commission was created as an independent agency by a Federal-Interstate Compact* among the States of Maryland, New York, Commonwealth of Pennsylvania and the Federal Government. In creating the Commission, the Congress and State Legislatures formally recognized the water resources of the Susquehanna River basin as a regional asset vested with local, State and National interests for which all the parties share responsibility. As the single Federal-Interstate water resources agency with basinwide authority, the Commission's goal is to effect coordinated planning, conservation, management, utilization, development and control of basin water resources among the government and private sectors.

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* Statutory Citations: Federal - Pub.L. 91-575, 84 Stat. 1509 (December, 1970); Maryland - Natural Resources §8-301 (Michie 1974); New York - ECL §21-1301 (McKinney 1973); and Pennsylvania - 32 P.S. 820.1 (Supp. 1976).

ASSESSMENT OF FLOODING
OF MUNICIPAL SEWAGE TREATMENT PLANTS
IN THE SUSQUEHANNA RIVER BASIN

BY

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PUBLICATION NO. 53

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SUMMARY

The Susquehanna River Basin Commission Compact and Comprehensive plan set forth objectives and goals for flood plain management. They include consideration of the effect of particular uses of the flood plain and requires a plan to guide flood plain development so as to reduce the risk of future flood loss. This study assesses the impact of the flooding of municipal sewerage treatment plants (MSTP) located in the Susquehanna River Basin.

The findings and recommendations of the study report will provide the Commission guidance in the evaluation and consideration of plans mitigating impacts from future flooding of MSTP's. This report summarizes the results of the study efforts by the Commission staff. All data deemed necessary for a complete staff assessment were not readily obtainable from governmental sources. Consequently information was solicited by questionnaires. With only a 60 percent response, many of which were incomplete, the total sum of available data remained insufficient for a definitive quantitative analyses. However, many significant findings were evident. They include:

1. Proper implementation of existing State and Federal regulations governing the location and construction of MSTP's will reduce the risk of flood damage.
2. Many MSTP's are vulnerable to recurrence of flooding damage.

3. Flood insurance coverage is inadequate for most MSTP's damaged by flooding.
4. The shut down of a MSTP by flooding has a relatively minor impact on water quality during flooding, but is subsequently a problem upon recession of the flood waters.

Subsequent to the completion of the draft study report, President Jimmy Carter issued Executive Order 11988 echoing the Commission's goals and objectives regarding management and use of the flood plains. It directs all agencies to reduce flood risk and minimize risk when a project location on the flood plain is deemed necessary.

INTRODUCTION

The Susquehanna River Basin Compact provides "the Commission shall consider the effect of particular uses of the flood plain in question on the health and safety of persons and property in the basin". The program objective, set forth in the Susquehanna River Basin Commission Comprehensive plan, is "to prevent loss of life and significantly reduce future damage from floods within the basin". With a history of recent major floods in the basin the Commissions directed its staff to conduct a study to provide them with an assessment of recent flooding of sewage treatment plants in the Susquehanna River Basin relative to flood-damage losses, flood loss reduction measures and the impact on water quality from loss of treatment capability.

The objectives of the study are: (1) identify those municipal sewage treatment plants located in the 100-year flood plain; (2) assess the damage incurred in recent flood experiences; (3) assess adjustments to the risk of flooding and the effectiveness of adjustments implemented after Tropical Storm Agnes; and (4) assess the impact of flood damaged treatment plants on the water quality of the receiving streams and the Chesapeake Bay.

An initial inventory of municipal sewage treatment plants in the basin was compiled from information available in State data files and pertinent studies such as Pennsylvania DER's COWAMP, New York Section 208 plans, Maryland's Section 303e

Lower Susquehanna River Basin Plan, New York 303e plans, and county sewerage studies. Because resulting information was insufficient for purposes of this study, a questionnaire was prepared and sent to all sewage treatment plant authorities (Appendix A). Flood plain information was taken from available SRBC flood plain mapping and hydraulics and from USGS flood hazard zone delineations. Available information was tabulated and prepared for statistical analyses,^{1/} however, incomplete data precluded full application of statistical tests. This information is evaluated and reported herein.

DISCUSSION

The Problem

Usually treatment plants are sited near waterways to facilitate gravity flow of sewerage from the collection system. The advantages of this practice are diminished when the plant is subject to flooding. Flooding of a plant can locally degrade water quality, making the receiving stream undesirable as a public water supply, place financial hardship on a municipality, and impose dependence of a municipality on flood disaster assistance.

^{1/} Barr, A. J. & Goodnight, J. H., Statistical Analysis System, Dept. of Statistics, N.C. State University, Raleigh, N.C., August 1972..

Sewage Treatment Plant Distribution

There are 285 municipal sewage treatment plants located within the Susquehanna River Basin (Figure 1). The general location of these plants is shown on the map in the pocket on the back cover. These plants have been aggregated by hydrologic subbasins (Table 1).

TABLE 1
MUNICIPAL SEWAGE TREATMENT PLANT DISTRIBUTION IN THE
SUSQUEHANNA RIVER BASIN BY HYDROLOGIC SUBBASIN

<u>Subbasin</u>	<u>No. of Sewage Treatment Plants</u>
1	25
2	14
3	45
4	3
5	37
6	42
7	29
8	<u>90</u>
Total	285

Elevation data for 237 plants were obtained and compared with available flood elevations to determine the number of plants in the 100-year flood plain. In order to determine the appropriate flood elevations for plants with flood protection, the elevation of the top of the floodwall or levee was used. One hundred twenty-seven plants were found to be located in the 100-

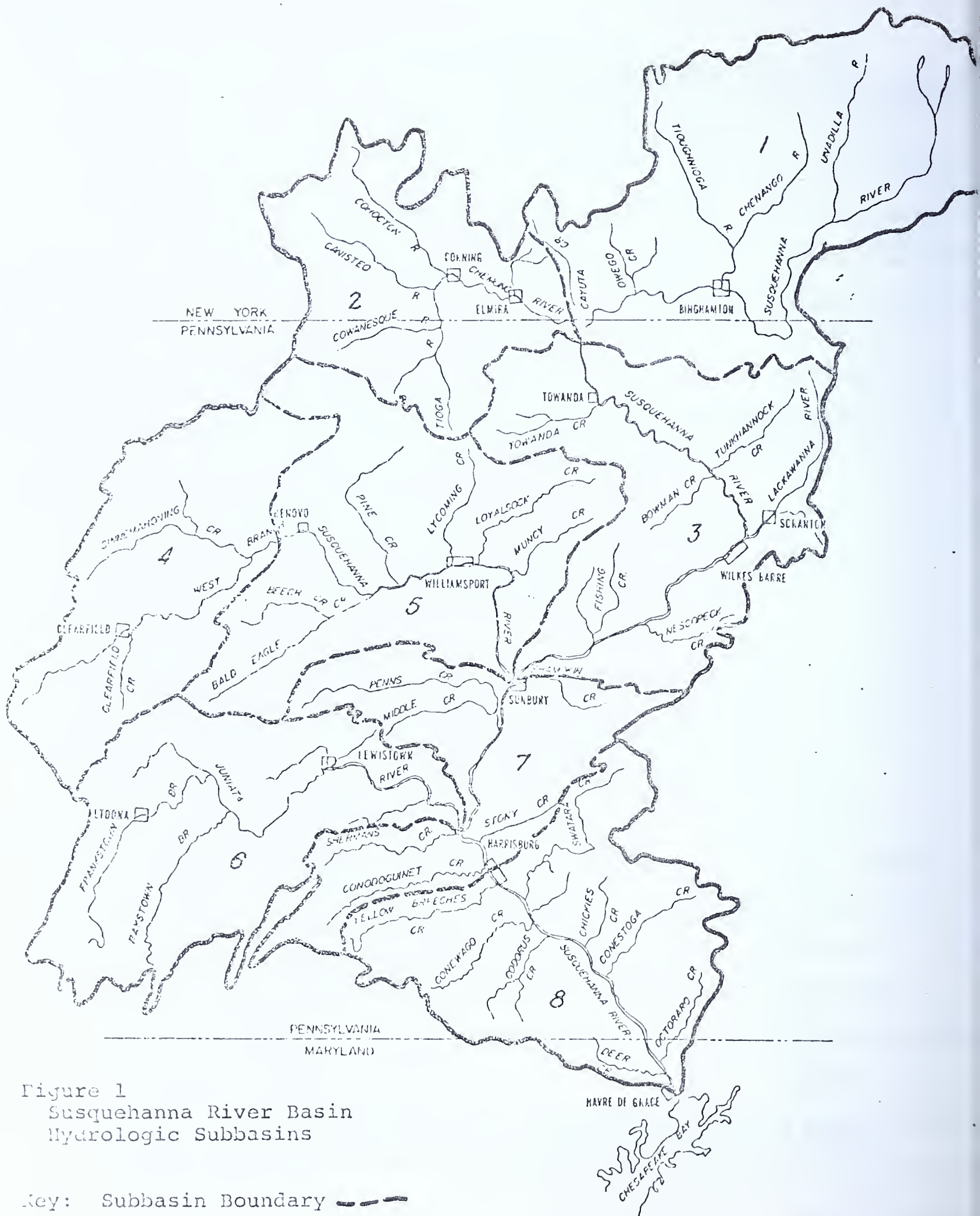


Figure 1
Susquehanna River Basin
Hydrologic Subbasins

Key: Subbasin Boundary - - -

year flood plain area. Relative flood plain locations were tabulated by subbasin in Table 2 and by community in Appendix B.

TABLE 2

FLOOD PLAIN LOCATION OF MUNICIPAL SEWAGE TREATMENT PLANTS
IN THE SUSQUEHANNA RIVER BASIN
BY HYDROLOGIC SUBBASIN

<u>Subbasin</u>	<u>10-Year</u>	<u>Cumulative 50-Year</u>	<u>Cumulative 100-Year</u>	<u>Outside 100-Year</u>
1	1	2	12	7
2	1	2	7	7
3	0	0	19	16
4	0	0	2	1
5	2	8	21	12
6	0	2	18	16
7	1	1	14	12
8	<u>5</u>	<u>3</u>	<u>34</u>	<u>39</u>
Totals*	10	18	127	110

* Data available for a total of 237 plants.

Flood Damage

When sewage treatment plants are inundated, various kinds of damage can occur. Pumping stations, lagoons and other low-lying components of the treatment system may be flooded before water enters the plant structure. A breakdown of equipment damage for sewage treatment plants flooded is shown in Table 3. Data received through the questionnaires indicated that 59 treatment plants located within the 100-year flood plain had never been flooded.

TABLE 3

FLOODING DAMAGE TO SEWAGE TREATMENT PLANT COMPONENTS
DUE TO TROPICAL STORMS AGNES (1972) AND ELOISE (1975)

<u>Component</u>	<u>Number of Plants</u>
Electrical Equipment	20
Pump Stations	4
Pumps	5
Tanks-lagoons	7
Combination of above	<u>8</u>
TOTALS	44

Electrical equipment was affected the most. Water damaged electrical equipment must be dried out or replaced before use, resulting in extended periods of downtime for the treatment plant. Consequently, every effort should be made to protect or remove this equipment. This is discussed further in the following section.

Available data for dollar damage to municipal treatment plants from flooding in 1972 and 1975 is summarized for several counties in Table 4.

Adjustments to Flooding

Mitigation of flood losses to municipal treatment plants can involve several measures. Structural measures such as levees or floodwalls protect plants from inundation but cannot protect against floods exceeding design level of the protective works. Effective use of flood proofing measures, emergency operations plans and flood insurance are other methods which complement

TABLE 4

FINANCIAL LOSSES TO MUNICIPAL SEWAGE TREATMENT FACILITIES
IN THE SUSQUEHANNA RIVER BASIN DUE TO FLOODING
FROM TROPICAL STORMS AGNES & ELOISE*

<u>New York</u>			<u>Pennsylvania</u>		
<u>County</u>	<u>Agnes</u>	<u>Eloise</u>	<u>County</u>	<u>Agnes</u>	<u>Eloise</u>
Allegany	\$ 669,354	\$ -	Clinton		\$ 11,000
Broome	38,731	178,963	Columbia		152,000
Chemung	2,122,543	162,796	Cumberland	Not Available	3,235
Chenango	219,010	-	Dauphin		5,000
Madison	442,162	14,085	Lebanon		15,000
Onondaga	499,012	85,007	Lycoming		17,780
Steuben	1,781,434	91,313	Montour		15,000
Tioga	58,599	2,770	Northumberland		126,354
-	-		Snyder		18,642
-	-		Tioga		106,500
-	-		Union		51,400
TOTALS	\$5,830,845	\$534,934			\$521,911

* Damage to Maryland Sewage Treatment plants not available.

structural measures and can lessen economic losses when flooding occurs. Locating treatment plants out of the flood plain is the optimum means of floodproofing. However, a consideration with this option is the greater cost associated with construction and operation of alternatives to a gravity flow system.

Availability, type and effectiveness of flood protection measures at sewage treatment plant sites were evaluated from

questionnaire responses. Information in Table 5 shows that only one-third of the plants had implemented flood protection measures of any kind. The majority of these plants are in areas protected by Federal, State, or local flood protection projects.

TABLE 5
FLOOD PROTECTION MEASURES FOR MUNICIPAL
SEWAGE TREATMENT PLANTS

<u>Type of Protection</u>	<u>Number of Plants</u>
No Protection	70
Levees/Floodwalls	24
Floodproofing	8
Levees & Floodproofing	<u>3</u>
TOTALS	105

Structural Measures & Floodproofing

Of the 24 sewage treatment plants protected by levees/floodwalls, eleven were inundated by Tropical Storms Agnes or Eloise. Information concerning treatment plant location and original operating year was aggregated to establish planning trends in new sewage treatment plant siting (Table 6).

Table 6 indicates that some plants becoming operational post-Agnes were built in the flood plain despite growing State, Federal and local concern about flood damages to these facilities. However, fourteen of these new plants utilized floodproofing, levees, or other means to reduce potential flood damages.

TABLE 6

INITIAL OPERATING YEAR AND FLOOD PLAIN LOCATION OF
MUNICIPAL SEWAGE TREATMENT PLANTS IN THE BASIN

<u>Operating Year</u>	<u>Number Of Plants</u>	<u>Number in 100-Year Flood Plain</u>	<u>Number Outside 100-Year Flood Plain</u>
Before 1956	55	26	29
1956-65	39	22	17
1966-72	49	29	20
1973 & after	<u>39</u>	<u>22</u>	<u>17</u>
TOTALS	182	99	83

Responses to the question regarding expansion plans at the same site were inconclusive because of small sample size. Only 14 responses indicated that expansion was planned with half reporting that floodproofing would be included. Some of the floodproofing measures are suitable for incorporation into an existing treatment plant or as part of the design for an upgraded plant, while others are more appropriate for inclusion in the design of a new plant (Appendix C).

Flood Insurance

Flood insurance is not a solution for flooding problems of vulnerable sewage treatment plants and does not replace the alternative of careful site selection for new plants (off flood plains). It is useful, however, for mitigating the economic impact on local, state, and federal governments caused by flooding of plants sited on the flood plain.

Only one of the forty-four plants damaged in 1972 and 1975 had flood insurance prior to 1972. An additional twenty-one in this group were insured after the Agnes flooding. (Of these, six are protected by levees.) This insuring activity may be reflective of Federal regulations instituted in March 1974, requiring grantees to purchase flood insurance as a condition for receipt of Federal monies for construction or acquisition of sewage treatment facilities in a flood prone area. Under the National Flood Insurance Program, not all components of the treatment system are insurable, however. Coverage is limited to walled and roofed buildings that are principally above ground and affixed to a permanent site. The HUD-FIA interpretation of "principally above ground" is that 51 percent of the cash value of the building is in its above ground portion. Thus, water and sewer lines, underground pumping structures and gas or liquid storage tanks cannot be insured under the current program. Therefore, many plants built with the EPA grant stipulation of flood insurance purchase would not be insurable for their entire value, if that value exceeded the maximum coverage, as is often the case.

Appendices D and F provides additional information about flood insurance coverage for a typical treatment plant.

Emergency Operations Plan

During periods of heavy rainfall, significant increase in flows to the treatment plant may be encountered from infiltration and combined storm sewer systems. These high flows may exceed the

treatment plant's capacity resulting in reduced treatment or sewer line backups. Thus, an emergency operations plan complements other flood loss reduction measures and can make the difference between maintenance of service or the total crippling of the sewage treatment system for an extended period of time. Treatment plant operators should be familiar with the particular flooding history of their existing plant or the flooding potential in a new plant. Each treatment plant should obtain flood crest conversion tables for the nearest National Weather Service river gage or forecast point. These tables will provide information about flood heights which will be a basis for each plant to develop an emergency operation plan. This plan would coordinate preventative action with river elevations to minimize damage to the plant. For example, it might be determined that a pump should be pulled at 15 feet flood stage, or electric service should be disconnected at 17 feet, eliminating some of the typical types of equipment damage. Pumps can be reinstalled when flood waters subside and the out-of-service time is less than that resulting from drying out or replacing flood-damaged electrical components.

The plan should provide for moving or elevating flammable materials and a safe storage area for toxic materials. If it is necessary to completely evacuate the plant, power should be shut off before abandonment. The emergency response plan should allow for simulation of an emergency so that plant personnel will know what to do and be able to respond quickly. The National Weather Service or the U. S. Geological Survey as well as other State and Federal agencies can provide valuable information for and assistance in preparing a flood emergency plan.

Municipal Sewage Treatment Plant Siting Regulations

Regulations aimed at reducing the exposure of wastewater treatment plants to flooding and minimizing the financial impact of damage to these utilities are in effect or being developed at the Federal and State levels. Effective implementation of existing regulations will serve to reduce flood damage to new and upgraded plants in the future.

Federal

On May 24, 1977, President Carter issued Executive Order 11988 which directs all agencies to reduce flood risk and minimize risk when it is deemed necessary to locate a project upon the floodplain. (See Appendix E.) If the only practical alternative requires siting in a floodplain, the project design will minimize potential harm to or within the floodplain. The Executive Order and the purpose and thrust of this Commission study are fully complementary. It is assumed that affected Federal agencies are developing responses and regulations pursuant to guidelines in the new Executive Order.

In addition, Region III offices of EPA have developed, as part of a guideline for their engineers, a "Regional Procedure Manual". Certain sections of that manual address and establish principles for construction in flood hazard areas and flood protection requirements (design) for the EPA Construction Grants Program (Appendix F). The pertinent Manual sections are intended also to implement requirements of the National Flood Disaster Protection Act of 1973 (P.L. 93-234) and the National Environmental Policy Act of 1969 (and also Executive Order 11296

which was revoked by Executive Order 11988).

New York

The New York local flood insurance participation legislation (Article 36 of the Environmental Conservation Law) requires State agencies to take affirmative action to minimize flood hazards and losses in connection with State owned/financed facilities as well as in the administration of State and State-assisted planning programs. This includes evaluation and reduction of flood hazards in the siting, planning construction and maintenance of such facilities. The New York Department of Environmental Conservation is drafting regulations to implement the law.

Pennsylvania

The Department of Environmental Resources Sewerage Manual states that wastewater treatment plants should be located at an elevation which is not subject to flooding or otherwise be adequately protected against flood damage. Another guideline prohibits plant construction financed by public funds within the 100-year flood plain unless such facilities are constructed or protected for the purposes of preventing flood damages.

Maryland

Under the 1976 Flood Hazard Management Act (Title 8 - subtitle 9a of the Natural Resources Law) use of land within an interim flood hazard area is not authorized unless persons proposing the project demonstrate to the county that water, sewage roads and other utilities are adequately floodproofed. All permanent structures associated with the use will be floodproofed for 100-year flood protection. The Maryland Department of Natural

Resources is to assure that State construction projects and State financed projects meet these requirements. The Maryland Department of Health is responsible for the floodproofing requirement for sewage treatment plants.

Impact of Inoperable Sewage Treatment Plants

The impact of inoperable sewage treatment plants on water quality during periods of high runoff is difficult to assess due to the large volumes of pollutants originating from urban and rural runoff and the relatively small contribution of sewage to the total loadings of the receiving stream. The significance of an inoperable sewage treatment plant develops after the flood as surface flows return to normal, but untreated municipal sewage flows commence to represent a significant proportion of total flow. The pathogenic bacteria and viruses that are present in untreated sewage (as indicated by fecal coliform) may affect the use of the water as a water supply source and restrict recreational uses. Prolonged discharge of untreated sewerage may impact on the aquatic life in the stream due to increased BOD and decreased dissolved oxygen levels.

Sewage treatment disruptions can persist after the flood waters recede because key equipment must be cleaned and/or repaired. Twenty-five plants servicing a population of about 500,000 were not able to provide full treatment of sewage during the plant recovery period after the Agnes flood. Four plants servicing 45,000 people could not provide full treatment of sewage during the plant recovery period following the 1975 Eloise flood.

Due probably to lesser intensity of flooding in many places from the Eloise event and greater preparedness, the downtime experienced by treatment facilities was much less (Table 7).

TABLE 7
MUNICIPAL SEWAGE TREATMENT PLANT DOWNTIME
CAUSED BY FLOODING

<u>Downtime</u>	<u>No. of Plants Agnes (1972)</u>	<u>No. of Plants Eloise (1975)</u>
Less than 1 week	11	3
One week to 1 month	9	0
One month to 3 months	5	1

FINDINGS AND RECOMMENDATIONS

This staff review attempted, based on a limited amount of data, to ascertain the relative vulnerability of municipal sewage treatment plants to flooding. From this assessment, the following findings and recommendations for mitigating impacts from future flooding are presented for consideration and possible action.

- I. Finding: Inadequacy of available data from State and Federal sources and incomplete response to the study questionnaire permit only limited conclusions.

Recommendation: Sewage Treatment facility applications should provide information regarding the location and elevation of the facility relative to the 100-year flood plain. For existing facilities such information should be obtained and made a matter of available record.

II. Finding: Proper implementation of existing State and Federal regulations governing the location and construction of municipal sewage treatment plants will reduce the risk of future flood damages to these facilities within certain limits.

Recommendation:

- A. In the process of delineating Section 201 facilities planning areas (under P.L. 92-500) for local governments, a statement should be included by the State reflecting policy on locating publicly-financed facilities in flood prone areas. Also, this statement of policy should be transmitted to previously designated 201 facilities planning areas.
- B. Comparative cost studies should be prepared as part of the planning process to evaluate the economic feasibility of locating plants out of the 100-year flood plain.
- C. The EPA Region III Regional Procedural Manual items related to construction in flood hazard areas and flood protection requirements should be revised to address effectively methods to reduce potential flood damages to municipal sewage treatment facilities financed by Federal funds and to be consistent with Executive Order 11988, rather than merely require flood insurance for such projects.

III. Finding: Many municipal sewage treatment plants are still vulnerable to recurrence of flooding damage and consequent inoperability since the floods of 1972 and 1975.

Recommendation:

- A. The Commission should request the U.S. Army Corps of Engineers, in cooperation with the States and EPA, to evaluate the feasibility of reducing the flood damage risk to unprotected municipal sewage treatment plants located on basin flood plains.
- B. Each sewage treatment plant should have an Emergency Operations Plan, providing for regular drills and updating, which can be activated when flooding is likely.
- C. Flood emergency planning and operations should be included and stressed in any program for training or licensing of treatment plant operators.
- D. Municipal sewage treatment plants should have flood insurance coverage.

IV. Finding: Flood insurance coverage provides inadequate reimbursement for most municipal sewage treatment plants when flood damage occurs.

Recommendation: The National Flood Insurance Program should periodically review existing coverage relative to municipal sewage treatment plants and raise the maximum amount

attainable commensurate with equipment replacement costs. Also, rate reductions for floodproofing could be allowed.

- V. Finding: The inundation of a treatment facility has a relatively minor impact on water quality in the receiving stream during periods of flood flow but becomes a problem as flood water recedes.

Recommendation: Design and implement measures that reduce treatment plant downtime should inundation occur in order to assure prompt return to service of flooded facilities.

- VI. Finding: Issuance of Executive Order 11988 addresses concerns identical with the thrust of this study. Several sections of that Executive Order requires follow-up activity by affected Federal agencies, which would be consistent with study findings and recommendations. Such action will provide an opportunity by the Commission to monitor agency compliance with the Executive Order.

Recommendation:

- A. The Commission should monitor the response to Executive Order 11988 by affected Federal and State agencies, especially for municipal sewage treatment plants.
- B. The Commission should coordinate with the Water Resources Council concerning the issuance of guidance on flood plain determination information (Section 2(a)(1)) for the Susquehanna River basin, and subsequent periodic evaluation of agency procedures as required by Section 5 of the Executive Order.

SUSQUEHANNA RIVER BASIN COMMISSION

FLOOD HAZARD INVESTIGATION --
MUNICIPAL WASTEWATER
TREATMENT FACILITIES

- A. Name of Plant or Sewer District: 242 Sewer District received questionnaires
138 questionnaires received by study deadline
- B. Business Mailing Address:

- C. Name and address of person who should be contacted if we have need for further information:

Name:

Address:

Telephone Number: ;

- D. Areas served by this facility: (List municipalities and population in each served by this facility)
-

1. Either on enclosed map, or your own, locate treatment plant, auxiliary facilities (pumping stations, etc.) and outline approximate service area. 78

2. Give treatment plant elevation (mean sea level) - 108, and, if known, note the river stage or elevation the plant begins to flood 41.

3. Does your plant have flood protection measures? (Such as flood walls, levees, flood proofing.) 107



yes



no

What type of Protection? 107

4. Has facility experienced the following problems from flooding? 104

Major equipment damage ☒ yes

When? _____

What Type? _____



no damage

Operational disruptions ☒ yes

70

What Type? _____

Level of treatment provided, length
of time out of service, etc. _____

☐ No disruptions

101 5. Is the plant insured for flood losses? ☐ yes ☐ no
If yes, what year was insurance purchased _____

102 6. Are there plans to enlarge the present treatment facilities
at the same location?

☐ yes ☐ no

If so, will the new facilities have flood protection?

☐ yes ☐ no

Additional information for our records:

105 7. Do you have a combined sewer system in your service area?

☐ yes ☐ no

106 8. Is infiltration a frequent problem with your plant operation?

☐ yes ☐ no

9. What chlorine limitations have been established for your
plant's effluent? 84

Maximum _____ mg/l
or
Minimum _____ mg/l

Please return questionnaire to: Marshall S. Goulding
Chief, Planning & Operations
Susquehanna River Basin Commission
5012 Lenker St.
Mechanicsburg, PA 17055

APPENDIX B

MUNICIPAL SEWAGE TREATMENT PLANTS
IN THE SUSQUEHANNA RIVER BASIN
SURVEY INFORMATION

New York

County/Municipality	Boundary of Flood Plain				Determination Of Flood Plain Location		Questionnaire Returned
	Location Within				FIA Mapping	USGS Flood Hazard Mapping	
	10 Year	50 Year	100 Year	Outside 100 Year			
Alleghany/ Alfred Village				X		X	
Broome/ Binghamton-Johnson City		X			X		X
Endicott Village	X				X		
Fenton Town				X		X	
Vestal Town				X	X		X
Chemung/ Horseheads Town			X		X		X
Southport Town (Elmira)		X			X		X
Chenango/ Bainbridge Village			X			X	X
Greene Village			X			X	
Norwich City			X			X	
Sherburne Village							
Cortland/ Cortland City			X			X	
Marathon Village							X
Delaware/ Sidney Village							X
Madison/ Hamilton Village							X
Morrisville (S.U.N.Y.)				X		X	
Onondaga/ Tully Village				X		X	
Otsego/ Cooperstown Village			X			X	
Oneonta City			X			X	X
Richfield Springs Village							

APPENDIX B

MUNICIPAL SEWAGE TREATMENT PLANTS
IN THE SUSQUEHANNA RIVER BASIN
SURVEY INFORMATION

County/Municipality	Boundary of Flood Plain				Determination of Flood Plain Location		Questionnai Returned
	Location Within				FIA Mapping	USGS Flood Hazard Mapping	
	10 Year	50 Year	100 Year	Outside 100 Year			
Steuben/ Addison Village Path Village Canisteo Village Corning City Erwin Town Hornell City Painted Post Vil- lage	X		X	X X	X X	X X	X X
Tioga/ Owego Town #1 Owego Town #2 Owego Village Owego Village (Valley View)			X	X X	X X X		X X

APPENDIX B

MUNICIPAL SEWAGE TREATMENT PLANTS
IN THE SUSQUEHANNA RIVER BASIN
SURVEY INFORMATION

Pennsylvania

County/Municipality	Boundary of Flood Plain				Determination Of Flood Plain Location		Questionnaire Returned
	Location Within				FIA Mapping	USGS Flood Hazard Mapping	
	10 Year	50 Year	100 Year	Outside 100 Year			
Adams/ Arendtsville Boro Biglerville Boro East Berlin Boro McSherrystown New Oxford Boro York Springs Boro			X X X X X	 X X X		X X X X X X	X X
Bedford/ Bedford Boro E. Providence Twp. E. St. Clair Twp. Everett Boro Saxton Boro W. St. Clair Twp.			 X X	X X 		X X X X	 X
Blair/ Logan Twp. Altoona West Altoona East Bellwood Boro Blair Twp. Duncansville Boro Frankstown Twp. Freedom Twp. Greenfield Twp. Holidaysburg Holidaysburg Boro Martinsburg Boro Roaring Spring Boro Snyder Twp. Tyrone Boro Williamsburg Boro			 X X X X 				

APPENDIX B

MUNICIPAL SEWAGE TREATMENT PLANTS
IN THE SUSQUEHANNA RIVER BASIN
SURVEY INFORMATION

Pennsylvania (Cont'd)

County/Municipality	Boundary of Flood Plain				Determination Of		Questionnaire Returned
	Location Within				Flood Plain Location		
	10 Year	50 Year	100 Year	Outside 100 Year	FIA Mapping	USGS Flood Hazard Mapping	
Cambria/ Ashville Boro Carrolltown Boro Gallitzin Twp. Hastings Boro Patton Boro				X X X X X		X X X X X	X X
Cameron/ Emporium Boro			X			X	
Centre/ Bellefonte Boro Benner Twp. Ferguson Twp. Liberty Twp. Liberty Twp. Milesburg Boro Rush Twp. Worth Twp.		X		X X	X	X X X X X	X
Chester/ Atglen Boro Oxford Boro			X X			X X	
Clearfield/ Clearfield Boro Curwensville Boro Houtzdale Boro				X		X X X	X X X
Clinton/ Beach Creek Boro Lock Haven City Loganton Boro Pine Creek Twp. Porter Twp. Renovo Boro			X			X	
	X				X		X
	X				X		X
				X	X		
Columbia/ Benton Boro Berwick Boro			X X			X X	X X

APPENDIX B

MUNICIPAL SEWAGE TREATMENT PLANTS
IN THE SUSQUEHANNA RIVER BASIN
SURVEY INFORMATION

Pennsylvania (Cont'd)

County/Municipality	Boundary of Flood Plain				Determination Of Flood Plain Location		Questionnaire Returned
	Location Within				FIA Mapping	USGS Flood Hazard Mapping	
	10 Year	50 Year	100 Year	Outside 100 Year			
Columbia/ Bloomsburg Town Briar Creek Twp. Catawissa Boro Hemlock Twp. Millville Boro Orangeville Boro			X X X X X			X X X X X	X
Cumberland/ Carlisle Boro E. Pennsboro (South Plant) E. Pennsboro (North Plant) Hampden Twp. (Indian Creek) Hampden Twp. Hopewell Twp. Lemoyne Boro Lower Allen Twp. Mechanicsburg Boro Mt. Holly Spgs. Boro New Cumberland Boro Newville Boro North Middleton Twp. Shippensburg Boro South Middleton Twp. Upper Allen Twp.	 X X X <						

APPENDIX B

MUNICIPAL SEWAGE TREATMENT PLANTS
IN THE SUSQUEHANNA RIVER BASIN
SURVEY INFORMATION

Pennsylvania (Cont'd)

County/Municipality	Boundary of Flood Plain				Determination Of		Questionnaire Returned
	Location Within				Flood Plain Location		
	10 Year	50 Year	100 Year	Outside 100 Year	FIA Mapping	USGS Flood Hazard Mapping	
Dauphin/ Williamstown Boro			X			X	X
Franklin/ Letterkenny Twp. Lurgan Twp.				X X		X X	X
Huntingdon/ Huntingdon Boro Logan Twp. Mt. Union Orbisonia Boro Porter Twp. Porter Twp. Shirleysburg Wood Twp.		X	X X X		X X	X	X X X
Juniata/ Delaware Twp. Fayette Twp. Mifflintown Boro Port Royal Boro			X X			X X	X X X X
Lackawanna/ Abbington Twp. Archbald Twp. Clarks Green Boro Moosic Boro Roaring Brook Twp. Elm Brook (in Roaring Brook Twp.) Scranton South Abbington Twp. Throop Boro				X X X X X X		X X X X X X	X
Lancaster/ Adamstown Boro Brecknock Twp. Christiana Boro Columbia Boro E. Hempfield Twp.				X X X		X X X	X X X

APPENDIX B

MUNICIPAL SEWAGE TREATMENT PLANTS
IN THE SUSQUEHANNA RIVER BASIN
SURVEY INFORMATION

Pennsylvania (Cont'd)

County/Municipality	Boundary of Flood Plain				Determination Of Flood Plain Location		Questionnaire Returned
	Location Within				FIA Mapping	USGS Flood Hazard Mapping	
	10 Year	50 Year	100 Year	Outside 100 Year			
Lancaster/ Elizabeth T. Ephrata Boro Lancaster City (North) Lancaster City (South) Lititz Boro Manheim Boro Marietta Boro Millersville Boro Mt. Joy Boro New Holland Boro Penn Twp. Quarryville Boro Salisbury Twp. Terre Hill Boro				X X X X X X X X		X X X X X X	X X X X X
Lebanon/ Annville Twp. Bethel Twp. Heidelberg Twp. Lebanon City Mt. Gretna Boro Palmyra Boro Union Twp.		X		X X X X X X	X X	X X X X X X	X X X X X
Luzerne/ Butler Twp. Butler Twp. Conyngham Boro Duryea Boro Fairview Twp. Freeland Boro Hanover Twp. Hazel Twp. Hazelton Twp. Kingston Twp. (Dallas Area Mun. Auth.) Nescopeck Boro Wright Twp.			X	X X X X X X X X X		X X X X X X X X X	X X X X

APPENDIX B

MUNICIPAL SEWAGE TREATMENT PLANTS
IN THE SUSQUEHANNA RIVER BASIN
SURVEY INFORMATION

Pennsylvania (Cont'd)

County/Municipality	Boundary of Flood Plain				Determination Of		Questionnaire Returned
	Location Within				Flood Plain Location		
	10 Year	50 Year	100 Year	Outside 100 Year	FIA Mapping	USGS Flood Hazard Mapping	
Luzerne/ Harvey's Lake							X
Lycoming/ Dubois town		X			X		
Montgomery		X			X		
Muncy B.				X	X		
Williamsport (Central)		X			X		X
Williamsport		X			X		X
Fairfield Twp.			X			X	
Jersey Shore Boro		X			X		X
Mifflin/ Brown Twp.			X			X	X
Burnham Boro			X			X	
Juniata Terrace Boro							X
Lewistown Boro		X			X		X
Union Twp.				X			X
Montour/ Danville Boro			X			X	
Derry Twp.			X			X	
Valley Twp.				X		X	X
Northumberland/ Delaware Twp.			X			X	X
Delaware Twp.			X			X	X
Milton Boro			X			X	
Mt. Carmel Twp.				X		X	
Northumberland Boro			X			X	
Ralpho Twp.			X			X	
Ralpho Twp.			X			X	X
Sunbury				X	X		
Turbotville Boro							
Turbot Twp.							
Watsontown Boro			X			X	X
Zerbe Twp.			X			X	X
Perry/ New Bloomfield Boro			X			X	

APPENDIX B

MUNICIPAL SEWAGE TREATMENT PLANTS
IN THE SUSQUEHANNA RIVER BASIN
SURVEY INFORMATION

Pennsylvania (Cont'd)

County/Municipality	Boundary of Flood Plain				Determination Of Flood Plain Location		Questionnaire Returned
	Location Within				FIA Mapping	USGS Flood Hazard Mapping	
	10 Year	50 Year	100 Year	Outside 100 Year			
Perry/ Duncannon Boro Liverpool Twp. Marysville Boro Millerstown Boro Newport Boro Penn Twp. Tyrone Twp.			X X X X	 X X	 X X	 X X X X X X	
Schuylkill/ Ashland B. East Union Twp. Frailey Twp. Pine Grove Boro Porter Twp. Ringtown Boro Shenandoah Boro Tremont Boro			 X X	 X X X X X	 X X X X X	 X X	
Snyder/ Beavertown Boro Center Twp. Freeburg Boro McClure Boro Middleburg Boro Middle Creek Twp. Hummels Wharf Perry Twp. Selinsgrove Boro Shamokin Dam Boro Spring Twp.	 X		 X X X X X	 X X X X	 X X X X X X	 X X X X X X	
Sullivan/ Eagles Mere Boro Eagles Mere Boro				 X X		 X X	
Susquehanna/ Montrose Boro Silver Lake Twp. Susquehanna Depot Boro			 X X	 X		 X X X X	

APPENDIX B

MUNICIPAL SEWAGE TREATMENT PLANTS
IN THE SUSQUEHANNA RIVER BASIN
SURVEY INFORMATION

Pennsylvania (Cont'd)

County/Municipality	Boundary of Flood Plain				Determination Of Flood Plain Location		Questionnaire Returned
	Location Within				FIA Mapping	USGS Flood Hazard Mapping	
	10 Year	50 Year	100 Year	Outside 100 Year			
Tioga/ Blossburg Boro			X			X	X
Elkland Boro				X		X	
Lawrenceville Boro				X		X	
Mansfield Boro			X			X	X
Wellsboro Boro				X		X	
Westfield Boro				X		X	
Union/ E. Buffalo							
Hartley Twp.			X			X	
Kelly Twp.				X	X		
Lewisburg Boro				X	X		X
Mifflinburg Boro				X		X	
New Berlin Boro							
White Deer Twp.				X		X	X
Wayne/ Clinton Twp.							
Wyoming/ Tunkhannock Boro				X		X	X
York/ Conewago Twp.			X			X	X
Dillsburg Boro			X			X	
Dover Boro			X			X	
Dover Twp.			X			X	
Fairview Twp.				X		X	
Felton Boro							X
Glen Rock Boro			X			X	
Hanover Boro			X			X	
Jackson Twp.				X		X	
Monaghan Twp.							X
Mount Wolf Boro			X			X	X
New Freedom Boro			X			X	
N. Codorus Twp.				X		X	
Red Lion				X		X	
Penn Twp.			X			X	X
Spring Grove Boro			X			X	X
Springettsburg Twp.				X	X		X

APPENDIX B

MUNICIPAL SEWAGE TREATMENT PLANTS IN THE SUSQUEHANNA RIVER BASIN SURVEY INFORMATION

Pennsylvania (Cont'd)

County/Municipality	Boundary of Flood Plain				Determination of Flood Plain Location		Questionnaire Returned
	Location Within				FIA Mapping	USGS Flood Hazard Mapping	
	10 Year	50 Year	100 Year	Outside 100 Year			
ork/ Stewartstown Boro Wrightsville Boro York City York Haven Boro	X		X		X	X	X X X X

APPENDIX B

MUNICIPAL SEWAGE TREATMENT PLANTS IN THE SUSQUEHANNA RIVER BASIN SURVEY INFORMATION

Maryland

County/Municipality	Boundary of Flood Plain				Determination of Flood Plain Location		Questionnai Returned
	Location Within				FIA Mapping	USGS Flood Hazard Mapping	
	10 Year	50 Year	100 Year	Outside 100 Year			
Cecil/ Port Deposit* Perryville Rising Sun				X X X	X X	X	X X X
Harford/ Havre De Grace*				X	X		X
*Flooded in 1972 & 1975.							

*Flooded in 1972 & 1975.

APPENDIX C

FLOODPROOFING MEASURES FOR INCORPORATION IN EXISTING SEWAGE TREATMENT PLANTS OR IN UPGRADING DESIGN PLANS --- --- (PARTIAL SUGGESTION LIST)

- A. Install watertight frame and cover assemblies in man-holes located in low-lying areas;
- B. Install groundwater relief valves in treatment unit tanks that may be subject to flotation facilitating filling of tanks prior to a flood;
- C. Install an emergency sluice gate in the influent line near the comminutor to by-pass all wastewater flows and/or provision of measures to seal off the wet well if influent flow cannot be shut off and the wastewater pumps are not operable. By-passing, during the high flows, is a temporary measure to prevent a total plant breakdown and allow for more timely return to normal operations;
- D. Raise the tops of treatment units above a specified maximum flood level;
- E. Elevate aerator drive, motors and other electrical equipment above a specified flood level;
- F. Construct lines and electrical conduits entering the treatment plants so as to prevent water leakage into the plant; and
- G. Protect chemical supplies against flooding, particularly toxic materials.

APPENDIX D

CALCULATION OF FLOOD INSURANCE FOR SEWAGE TREATMENT PLANTS

No Federal Grant assistance can be provided for construction or acquisition of sewage treatment facilities if a community has not become eligible for the National Flood Insurance Program by the eligibility expiration date. The grantee must have insurance beginning with the period of construction and continuing for the entire operating life of the project if the total value of the insurable improvements is \$10,000 or more. The amount of insurance required is the total project cost less land costs and uninsurable portion of the facilities, or the maximum coverage under the flood insurance program (whichever is less). The insurance premium is an allowable project cost for inclusion in the grant request.

If 20 percent of the cost of a \$4 million sewage treatment system consisted of insurable above ground buildings, (\$800,000) and there were two buildings of equal value, then under the regular program each building could be insured for the \$200,000 maximum. If the buildings were valued at \$100,000 and \$700,000 then \$100,000 and \$200,000 of insurance respectively would be available in the regular program. Under the current law, the maximum coverage for a non-residential policy (the category containing treatment plants) is \$100,000 under the emergency program, and \$200,000 under the regular program.

For flood insurance claims, the greater of \$200 or 2 percent is deductible, for structures and contents. Rates under the

emergency program are 40¢ per \$100 for up to \$100,000 of coverage. Actuarial rates under the regular program for insurable structures will vary substantially for the second \$100,000 level of coverage. When a community enters the regular program, the premium of the first level of coverage is the lesser of the subsidized or actuarial rates. The remainder of the treatment system such as underground pipes, pumping stations, holding tanks and parts of the system in an unenclosed building are not insurable. As mentioned previously, the cost of insurance can be included in the EPA grant request, but the value of these premiums may have to be estimated for the second level of coverage if the municipality is not in the regular flood insurance program when the request is made.

Flood insurance is not available in a community until the community joins the emergency insurance program. Thus, the EPA grant provision of insurance purchase for sewage treatment plants does not apply to communities that are not in the program. A flood prone community that has not joined the emergency program by the deadline risks losing eligibility for a Federal EPA grant.

Although insurance is required on Federally-financed additions to existing treatment plants which are located in the flood hazard zone, it is advisable to purchase insurance for the older portions of the facility as well.

For greater detail on EPA guidelines concerning flood insurance for Federally-financed projects, see Appendix F.

FLOODPLAIN MANAGEMENT

By virtue of the authority vested in me by the Constitution and statutes of the United States of America, and as President of the United States of America, in furtherance of the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.), the National Flood Insurance Act of 1968, as amended (42 U.S.C. 4001 et seq.), and the Flood Disaster Protection Act of 1973 (Public Law 93-234, 87 Stat. 975), in order to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative, it is hereby ordered as follows:

Section 1. Each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

Sec. 2. In carrying out the activities described in Section 1 of this Order, each agency has a responsibility to evaluate the potential effects of any actions it may take in a floodplain; to ensure that its planning programs and budget requests reflect consideration of flood hazards and

floodplain management; and to prescribe procedures to implement the policies and requirements of this Order, as follows:

(a)(1) Before taking an action, each agency shall determine whether the proposed action will occur in a floodplain -- for major Federal actions significantly affecting the quality of the human environment, the evaluation required below will be included in any statement prepared under Section 102(2)(C) of the National Environmental Policy Act. This determination shall be made according to a Department of Housing and Urban Development (HUD) floodplain map or a more detailed map of an area, if available. If such maps are not available, the agency shall make a determination of the location of the floodplain based on the best available information. The Water Resources Council shall issue guidance on this information not later than October 1, 1977.

(2) If an agency has determined to, or proposes to, conduct, support, or allow an action to be located in a floodplain, the agency shall consider alternatives to avoid adverse effects and incompatible development in the floodplains. If the head of the agency finds that the only practicable alternative consistent with the law and with the policy set forth in this Order requires siting in a floodplain, the agency shall, prior to taking action,

- (i) design or modify its action in order to minimize potential harm to or within the floodplain, consistent with regulations issued in accord with Section 2(d) of this Order, and
- (ii) prepare and circulate a notice containing an explanation of why the action is proposed to be located in the floodplain.

(3) For programs subject to the Office of Management and Budget Circular A-95, the agency shall send the notice, not to exceed three pages in length including a location map, to the state and areawide A-95 clearinghouses for the geographic areas affected. The notice shall include:

(i) the reasons why the action is proposed to be located in a floodplain; (ii) a statement indicating whether the action conforms to applicable state or local floodplain protection standards and (iii) a list of the alternatives considered. Agencies shall endeavor to allow a brief comment period prior to taking any action.

(4) Each agency shall also provide opportunity for early public review of any plans or proposals for actions in floodplains, in accordance with Section 2(b) of Executive Order No. 11514, as amended, including the development of procedures to accomplish this objective for Federal actions whose impact is not significant enough to require the preparation of an environmental impact statement under Section 102(2)(C) of the National Environmental Policy Act of 1969, as amended.

(b) Any requests for new authorizations or appropriations transmitted to the Office of Management and Budget shall indicate, if an action to be proposed will be located in a floodplain, whether the proposed action is in accord with this Order.

(c) Each agency shall take floodplain management into account when formulating or evaluating any water and land use plans and shall require land and water resources use appropriate to the degree of hazard involved. Agencies shall include adequate provision for the evaluation and consideration of flood hazards in the regulations and operating procedures for the licenses, permits, loan or grants-in-aid programs that they administer. Agencies

shall also encourage and provide appropriate guidance to applicants to evaluate the effects of their proposals in floodplains prior to submitting applications for Federal licenses, permits, loans or grants.

(d) As allowed by law, each agency shall issue or amend existing regulations and procedures within one year to comply with this Order. These procedures shall incorporate the Unified National Program for Floodplain Management of the Water Resources Council, and shall explain the means that the agency will employ to pursue the nonhazardous use of riverine, coastal and other floodplains in connection with the activities under its authority. To the extent possible, existing processes, such as those of the Council on Environmental Quality and the Water Resources Council, shall be utilized to fulfill the requirements of this Order. Agencies shall prepare their procedures in consultation with the Water Resources Council, the Federal Insurance Administration, and the Council on Environmental Quality, and shall update such procedures as necessary.

Sec. 3. In addition to the requirements of Section 2, agencies with responsibilities for Federal real property and facilities shall take the following measures:

(a) The regulations and procedures established under Section 2(d) of this Order shall, at a minimum, require the construction of Federal structures and facilities to be in accordance with the standards and criteria and to be consistent with the intent of those promulgated under the National Flood Insurance Program. They shall deviate only to the extent that the standards of the Flood Insurance Program are demonstrably inappropriate for a given type of structure or facility.

(b) If, after compliance with the requirements of this Order, new construction of structures or

facilities are to be located in a floodplain, accepted floodproofing and other flood protection measures shall be applied to new construction or rehabilitation. To achieve flood protection, agencies shall, wherever practicable, elevate structures above the base flood level rather than filling in land.

(c) If property used by the general public has suffered flood damage or is located in an identified flood hazard area, the responsible agency shall provide on structures, and other places where appropriate, conspicuous delineation of past and probable flood height in order to enhance public awareness of and knowledge about flood hazards.

(d) When property in floodplains is proposed for lease, easement, right-of-way, or disposal to non-Federal public or private parties, the Federal agency shall (1) reference in the conveyance those uses that are restricted under identified Federal, State or local floodplain regulations; and (2) attach other appropriate restrictions to the uses of properties by the grantee or purchaser and any successors, except where prohibited by law; or (3) withhold such properties from conveyance.

Sec. 4. In addition to any responsibilities under this Order and Sections 202 and 205 of the Flood Disaster Protection Act of 1973, as amended (42 U.S.C. 4106 and 4128), agencies which guarantee, approve, regulate, or insure any financial transaction which is related to an area located in a floodplain shall, prior to completing action on such transaction, inform any private parties participating in the transaction of the hazards of locating structures in the floodplain.

Sec. 5. The head of each agency shall submit a report to the Council on Environmental Quality and to the Water Resources Council on June 30, 1978, regarding the status of their procedures and the impact of this Order on the agency's operations. Thereafter, the Water Resources Council shall periodically evaluate agency procedures and their effectiveness.

Sec. 6. As used in this Order:

(a) The term "agency" shall have the same meaning as the term "Executive agency" in Section 105 of Title 5 of the United States Code and shall include the military departments; the directives contained in this Order, however, are meant to apply only to those agencies which perform the activities described in Section 1 which are located in or affecting floodplains.

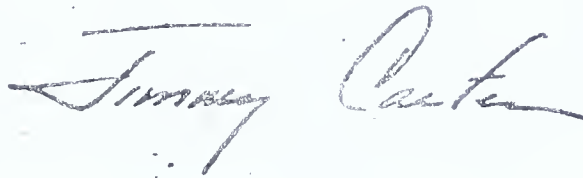
(b) The term "base flood" shall mean that flood which has a one percent or greater chance of occurrence in any given year.

(c) The term "floodplain" shall mean the lowland and relatively flat areas adjoining inland and coastal waters including floodprone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year.

Sec. 7. Executive Order No. 11296 of August 10, 1966, is hereby revoked. All actions, procedures, and issuances taken under that Order and still in effect shall remain in effect until modified by appropriate authority under the terms of this Order.

Sec. 8. Nothing in this Order shall apply to assistance provided for emergency work essential to save lives and protect property and public health and safety, performed pursuant to Sections 305 and 306 of the Disaster Relief Act of 1974 (88 Stat. 148, 42 U.S.C. 5145 and 5146).

Sec. 9. To the extent the provisions of Section 2(a) of this Order are applicable to projects covered by Section 104(h) of the Housing and Community Development Act of 1974, as amended (88 Stat. 640, 42 U.S.C. 5304(h)), the responsibilities under those provisions may be assumed by the appropriate applicant, if the applicant has also assumed, with respect to such projects, all of the responsibilities for environmental review, decisionmaking, and action pursuant to the National Environmental Policy Act of 1969, as amended.



THE WHITE HOUSE,
May 24, 1977

[FR Doc. 77-15121 Filed 5-24-77; 1:42 pm]

APPENDIX F
EPA REGIONAL PROCEDURE MANUAL
(ITEM NO. 18)

CONSTRUCTION IN FLOOD HAZARD AREAS AND
FLOOD PROTECTION REQUIREMENTS (DESIGN)

I. PURPOSE

The purpose of this paper is to establish responsibility and procedure for implementing the requirements of the National Flood Disaster Protection Act of 1973 (PL 93-234) as they pertain to the EPA Construction Grants Program and to establish principles for Facilities Management Branch review of Step 2 and 3 grant applications so that they conform with EPA flood design criteria.

II. REFERENCES

- a. 40 CFR 30.405-10 of the Rules and Regulations
- b. Grants Information Guide, July 1, 1975
- c. Consideration of Flood Hazards in Approving Grants and Reviewing Plans and Specifications - FWPCA-PG 66-41
- d. Design, Operation and Maintenance of Wastewater Treatment Facilities - September, 1970
- e. Recommended Standards for Sewage Works (10 State Standard) 1971 - Revised
- f. Flood Hazard Evaluation Guidelines for Federal Executive Agencies - May, 1972
- g. Engineering Data Manual, Ecodyne Corporation, Smith and Loveless Division
- h. East Kanawha PSD Design Report - S. H. Habib, October, 1973
- i. Flood Hazard Evaluation Guidelines - EPA - PG 15-74
- j. Design Criteria for Mechanical, Electric and Fluid System and Component Reliability (EPA-430-99-74-001)

III. DISCUSSION

- The Flood Disaster Protection Act of 1973 (PL 93-234, December 31, 1973) requires participation in the National Flood Insurance Program and the purchase of flood insurance by the grantee on and after March 2, 1974, as a condition of receiving any form of Federal or Federally-related assistance for construction purposes or for the acquisition of any real or non-expendable personal property in an identified special flood hazard area.

For any community that was not participating in the program at the time the assistance was approved, the statutory requirement for the participation in the Flood Insurance Program and the purchase of flood insurance does not apply. However, after July 1, 1975, or one year after notification of identification as a flood prone community, whichever is later, the requirement will apply to all communities containing identified special flood hazard areas within the United States, which have been delineated on Flood Hazard Boundary Maps or Flood Insurance Rate Maps issued by HUD. Thereafter, no financial assistance can legally be provided for construction purposes in these areas unless the community has entered the program and flood insurance is purchased.

Note that according to this section of the regulations (40 CFR 30.405-10 (a)(2)), a community may receive a grant for construction of insurable facilities in a designated Flood Hazard Area, without participating in the insurance program nor purchasing flood insurance, if the community has been identified as a floodprone community by HUD less than one year before the grant award is to be made.

IV. EPA GRANTEE REQUIREMENTS

If it is determined that the flood insurance requirements apply, the grantee or the construction contractor, as appropriate, must acquire flood insurance made available to it under the National Flood Insurance Act of 1968, as amended, beginning with the period of construction and maintain such insurance for the entire useful life of the project if the total value of insurable improvements (i.e., above ground structures having four walls and a roof) is \$10,000 or more. The contractor is to obtain the required insurance during the construction period as indicated by Item 6.c of the Federal Specifications Insert. Thereafter it is the grantee's responsibility. The amount of insurance required is the total construction cost, excluding facilities which are uninsurable under the National Flood Insurance Program, such as bridges, dams, water and sewer lines, and underground structures, and excluding the cost of the land, or the maximum limit of coverage made available to the grantee under the National Flood Insurance Act, whichever is less. The required insurance premium for the period of construction is an allowable project cost.

If EPA provides financial assistance for non-expendable personal property to a grantee that the Agency has previously assisted with respect to real estate at the same facility in the same location, EPA must require flood insurance on the previously-assisted building as well as on the personal property. The amount of flood insurance required on the building should be based upon its current value, however, and not on the amount of assistance previously provided.

V. FACILITIES MANAGEMENT BRANCH REVIEW

Attached is a checklist for Flood Insurance Requirements to be completed by the Grants Administration Branch during its initial review of an application. The reviewer should first determine if the applicant or any

communities, towns, boroughs, municipalities, or counties included in the service area of the project has been notified by HUD as containing designated flood hazard areas. This information can be found in the consolidated list published by the U. S. Department of Housing and Urban Development, Federal Insurance Administration, which identifies those communities wherein the sale of flood insurance is authorized under the program, and also those communities which have been identified as containing flood hazard areas but are not participating in the program. This list is updated monthly.

When the Facilities Management Branch Project Engineer receives the Step III Grant Application, he will first determine if any of the facilities for which financial assistance is being sought are insurable, and, if so, if they are located within the boundaries of the designated flood hazard areas. This can be accomplished by utilizing HUD's Flood Hazard Boundary Maps. If the project engineer determines that the project scope includes insurable facilities with a value of \$10,000 or more, located within a designated flood hazard area, the purchasing of flood insurance will be made a condition of the grant offer.

If it is determined that the project scope includes \$10,000 or more worth of insurable facilities located in a designated flood hazard area, and the community in which the insurable facilities are located is non-participating and has been notified by HUD as containing designated flood hazard areas more than one year before the anticipated date of the grant award, the applicant should be advised that no Federal assistance will be rendered until the community becomes a participant in the Flood Insurance Program.

For projects which are already under review in the Facilities Management Branch, the project engineer will complete the attached Flood Insurance Requirements checklist, using the procedure outlined earlier.

When the purchasing of flood insurance is made a grant condition, the authorized representative of the grantee should certify to EPA, when applying for partial grant payments, that the required flood insurance is being carried during the construction period. When final inspection is made, the inspecting engineer should ask to see the policy in order to confirm that the necessary items are insured for at least the required amount.

It is recognized that pumping stations and wastewater treatment facilities are frequently located in flood prone areas and, that a flood hazard is characteristic of such locations. It is also recognized that the location of such facilities is primarily the responsibility of the applicant as guided by local laws and ordinances.

The attached forms should be completed to insure that the EPA published design criteria outlined in references (d) and (i) are met.

C H E C K L I S T

Flood Insurance Requirements

- A) Has the Applicant or any communities, towns, boroughs, municipalities, or counties included in the service area of the project been notified by HUD as containing designated flood hazard areas?

YES _____ DATE _____ (If YES answer B)

NO _____

- B) Is the Applicant and all communities in the service area of the project containing designated flood hazard areas, participating in the National Flood Insurance Program?

YES _____

NO _____

EPA REGIONAL PROCEDURE MANUAL
(ITEM NO. 18A)

CONSTRUCTION IN FLOOD HAZARD AREAS AND
FLOOD PROTECTION REQUIREMENTS (DESIGN)

I. PURPOSE

The purpose of this paper is to establish responsibility and procedures for implementing the requirements of the National Flood Disaster Protection Act of 1973 (PL 93-234) and its relationship with the National Environmental Policy Act (NEPA) of 1969, Executive Order 11296, and the EPA Construction Grants Program.

II. REFERENCES

- a. National Environmental Policy Act of 1969, (PL 91-190), January 1, 1970
- b. 40 CFR Part 6, "Preparation of Environmental Impact Statements," Federal Register, Volume 40, No. 72, April 14, 1975
- c. Executive Order 11296, August 11, 1966
- d. Flood Disaster Protection Act of 1973
- e. 40 CFR, "Federal Insurance Administration," Federal Register, Volume 40, No. 59, March 26, 1975
- f. 40 CFR Part 30, "Grant Regulations and Procedures," Federal Register, Volume 40, No. 90, May 8, 1975

III. DISCUSSION

Essentially, Issue Paper No. 18 presents the Facilities Management Branch's responsibilities and procedures to assure that all above ground structures, receiving Federal funds through the EPA Construction Grants Program, are properly insured. The information presented in this Issue Paper focuses, in addition to Facilities Management Branch's concerns, on secondary impacts resulting from increased development in flood plains, and stresses the importance that communities should be participating in the National Flood Insurance Program (NFIP) and have adopted or be working towards adopted floodplain ordinances prior to a Step III grant award. One overriding concern shared by EPA in developing these Issue Papers was the fact that Facilities Management Branch would adequately safeguard the flooding potentials for above ground structures and that Water Planning Branch would adequately protect the people who inhabited these environmentally sensitive areas.

IV. WATER PLANNING BRANCH RESPONSIBILITIES AND PROCEDURES

The Water Planning Branch's flood insurance responsibilities and subsequent procedures are presented in the following manner:

1. A general format to be followed by reviewers which can be incorporated into the "201 Grants Review Procedures" used by Branch personnel is presented in Attachment A;
2. A checklist/questionnaire which can be followed by Branch personnel and should be incorporated into the Step 2/3 Planning Review Form is presented in Attachment B; and
3. A proposed coordination procedure for construction grant projects so that they may receive proper priority and recognition by State coordinators involved in floodplain issues and by HUD is presented in Attachment C. This reporting system will focus on moving projects out of the Emergency Flood Insurance Program and into the Regular Flood Insurance Program.

ATTACHMENT A

FLOOD INSURANCE PROCEDURES

Upon receiving the grant application the reviewer will identify the project's status regarding:

1. HUD's designation of identified flood prone areas (this information is available through the bound consolidated booklet - List No. 1, which itemizes communities participating in the National Flood Insurance Program (NFIP)). NOTE: This list indicates when the flood hazard area was identified, (a community is given one year from this identification date to participate in the Emergency Flood Insurance Program (EFIP) or be denied federal or federally-related financial assistance until participation), the community number and whether the community is participating in the EFIP or the Regular Flood Insurance Program (RFIP) (communities are in the EFIP unless the letter "R", appears after the name of the community and then it is in the RFIP). See pages F-10 and 11, outlining the necessary requirements for acceptance into the EFIP and RFIP, respectively. When communities are listed as participating but have no date for a hazard area being identified, it means that HUD has not developed a Flood Hazard Boundary Map (FHBM) and therefore, the exact flood hazard area has not yet been identified by HUD. Code letters A, B and C are sometimes part of the community numbers, indicating FHBM revisions.

If the community is participating in the EFIP, check List No. 2. This list outlines those communities that have proposed, begun or completed the hydrologic studies that provide the community with a Flood Insurance Rate Map (FIRM). With this detailed information, the community must implement land use controls (see Page F-11) to satisfy the requirements of the RFIP.

2. If the community is not listed in the first section of List No. 1's booklet, check the third section which lists communities that have been identified by HUD as having special flood prone areas and are not participating in the NFIP. These communities are not eligible for federal or federally-related financial assistance until they enter the EFIP (40 CFR May 8, 1975 Section 30.405-10). NOTE: The community (applicant) should realize that the non-participating status prohibits not only EPA funds but other federally-related financial assistance programs (i.e. the Small Business Administration, Farmers Home Administration, Veterans Administration, Federal Housing Administration, and conventional construction and mortgage loans from federally-insured lending institutions, such as banks insured by the Federal Deposit Insurance Corporation and the Federal Savings and Loan Insurance Corporation).

The following section will focus on the relationship of NEPA and Executive Order 11296 with the NFIP.

-
1. The application should be checked for all communities, towns, boroughs, municipalities, and/or counties that are included in the planning area of the project.
 2. NOTE: Information is updated monthly.

It should appear evident that the current rationale used (i.e. underground structures are not insurable) in permitting interceptors to transverse through floodplains is not in full compliance with NEPA and Executive Order 11296. Essentially, NEPA's theme is in preserving the unique and significant public value of the floodplain as an environmental resource. Executive Order 11296 expresses the opinion that alternatives should be considered, which would preclude the uneconomic, hazardous or unnecessary use of floodplains to potential flood damage, and therefore lessen the need for future federal expenditures for flood protection and flood disaster relief.

In complying with NEPA, WPB should consider the following (points two (2) through five (5) need to be evaluated only when the problem is significant):

1. Determine the level of significance for interceptors (see example Cases 1 through 3 for definition of significance).
 - a. Check the location of the interceptors in relationship to the Special Flood Hazard Areas (SFHA) identified by HUD in the Flood Hazard Boundary Maps.
 - b. Could the routing induce development in the SFHA.

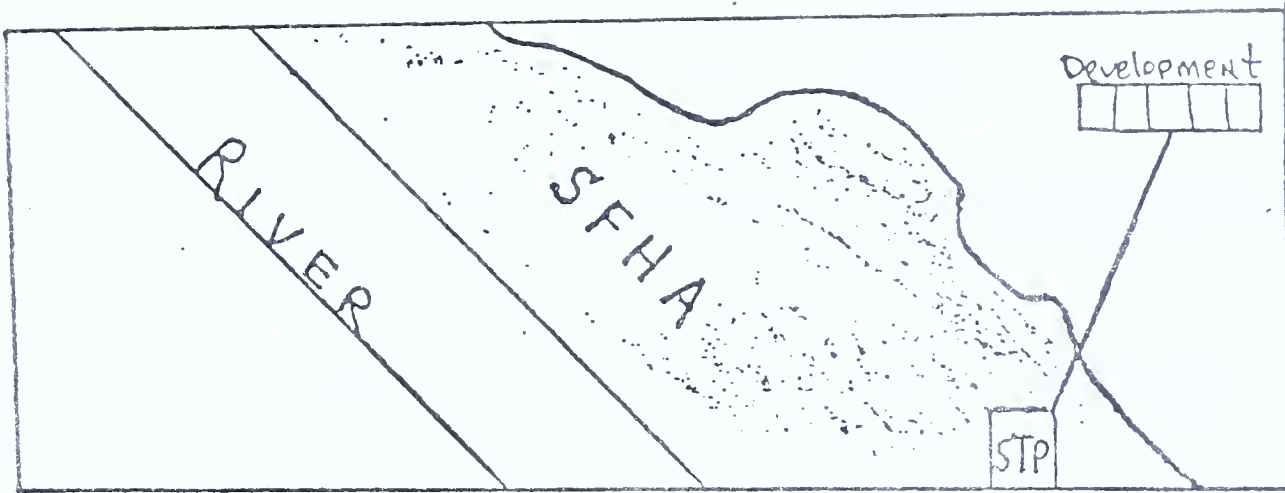
Case 1



1. The level is not significant
2. The project will not induce development in the SFHA

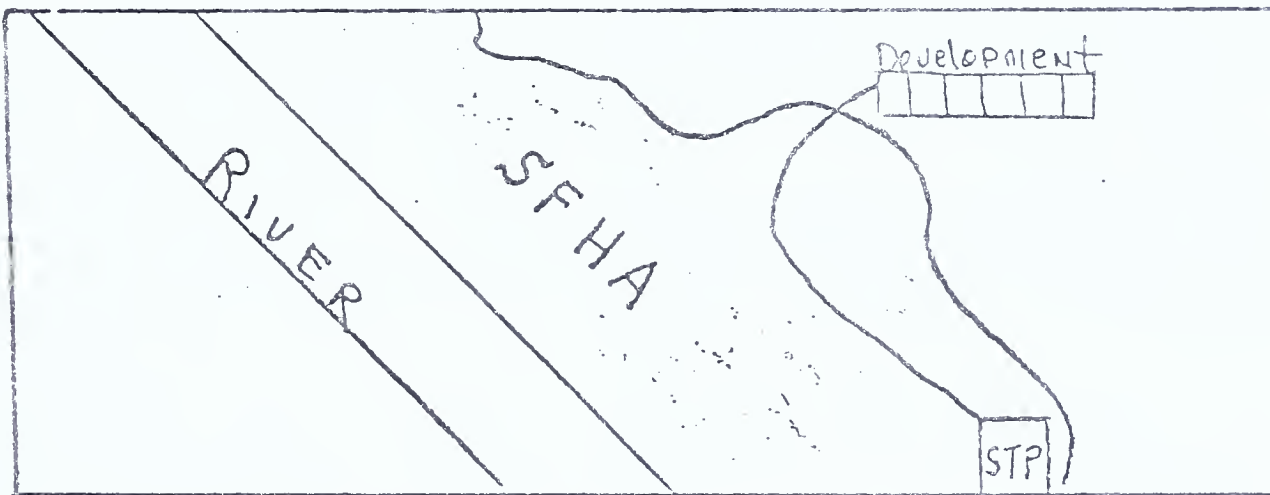
NOTE: FMB will insure that the treatment works' structures and electrical and mechanical equipment will be protected from physical damage by the maximum expected 100 year flood. Additionally, the treatment works will remain fully operational during the 25 year flood.

Case 2



- a. The level is not significant although a portion of the interceptor runs through the SFHA.
- b. It should not induce development in the SFHA.

Case 3



- a. The level is significant
- b. The project could conceivably induce growth in the SFHA.

2. If the level is significant has the applicant considered routing alternatives?
3. Does the sizing of the interceptors in the SFHA serve existing needs and allow acceptable reserve capacity. Relate to land use management ordinance if possible.
4. Has the applicant considered structural and/or non-structural methods to minimize flood damage in the SFHA.
5. Has the applicant submitted a flood plain ordinance, if one exists.
6. The options available to the reviewer if a significant problem still exists are:
 - a. Submit the project in accordance with the priority reporting system.
 - b. Condition the grant award on the development of a floodplain ordinance that would satisfy HUD's RFIP requirements (see Appendix B and a Model Ordinance).

THE EMERGENCY FLOOD INSURANCE PROGRAM

Based on existing records and evidence, the Federal Insurance Administration (FIA) will pay the full cost for a private firm to prepare a Flood Hazard Boundary Map (FHBM) showing the limits of the 100-year flood.

When a community expresses interest in participating or when the FIA notifies it of its tentative identification as containing one or more flood-prone areas, the local government seeking eligibility must certify that it will regulate certain aspects of future construction. The required standards of the Emergency Program under Section 1910.3(a) and (b) of the FDPA are as follows:

1. Require building permits for proposed construction or other improvements.¹
 2. Review all building permit applications for new construction or substantial improvements assuring that they:¹
 - a. Be designed and anchored to prevent flotation, collapse, or lateral motion;
 - b. Use construction materials and utility equipment that are resistant to flood damage; and
 - c. Use construction methods and practices that will minimize flood damage.
 3. Review subdivision proposals to assure that:¹
 - a. They are consistent with the need to minimize flood damage;
 - b. Public utilities are located and constructed to minimize flood damage; and,
 - c. Adequate drainage is provided so as to reduce exposure to flood hazards.
 4. Require any new or replacement water supply or sewage systems to be designed to minimize infiltration of flood waters into the systems and discharges flow the system into the floodwaters, and require on-site waste disposal systems to be located so as to avoid impairment or contamination from them during flooding.¹
 5. Take into account any existing flood plain management plans of neighboring communities.¹
-
1. If the FIA has identified flood hazard areas, these regulations will apply only to those designated areas.

THE REGULAR FLOOD INSURANCE PROGRAM

Using the services of federal agencies (e.g., COE, SCS, USGS, NOAA) and private firms, the FIA will provide the community with a Flood Insurance Rate Map (FIRM).

The FIRM will designate the water surface elevations of the 100-year flood and the floodway (defined as the area of the 100-year flood which results from constricting all shorelines until the 100-year flow raises exactly one foot at all points).

With this detailed information, the community must implement land use controls containing the following additional standards (from Section 1910.3(c) and (d) of the FDPA):

1. Require new construction or substantial improvements of residential structures within the areas of special flood hazards to have the lowest floor (including basement) elevated to or above the 100-year flood:
2. Require new construction or substantial improvements of nonresidential structures within the area of special flood hazards to have the lowest floor (including basement) elevated to or above the 100-year flood, or to be flood-proofed to the 100-year flood;
3. Provide that existing nonconforming uses in the floodway shall not be expanded, but may be modified to incorporate flood proofing measures provided such measures do not raise the level of the 100-year flood; and
4. Prohibit fill or encroachments into the floodway that would impair its ability to carry and discharge the waters of the 100-year flood, unless where the effect on flood heights is offset by stream improvements.

ATTACHMENT B

CHECKLIST/QUESTIONNAIRE FOR FLOOD INSURANCE PROCEDURES

Upon receiving the grant application the reviewer will answer the following questions to insure consistency in the construction grants program.

1. Has the community been identified by HUD as having flood prone areas.

Yes _____ No _____

Community No. _____ Date _____

If not disregard the following questions.

2. Is the community participating in the National Flood Insurance Program.

Yes _____ No _____

3. Is the community in the Emergency Flood Insurance Program _____ or the Regular Flood Insurance Program _____.

4. If the community is participating in the Emergency Flood Insurance Program is the community listed on List No. 2.

Yes _____ No _____

- a. If yes, what is the status of the hydrologic study

Proposed _____ Underway _____ Complete _____

- b. If no, is the project significant enough to consider placement on the quarterly compiled priority list sent to HUD and state representatives involved in flood plain issues (see Attachment C).

Yes _____ No _____

ATTACHMENT C

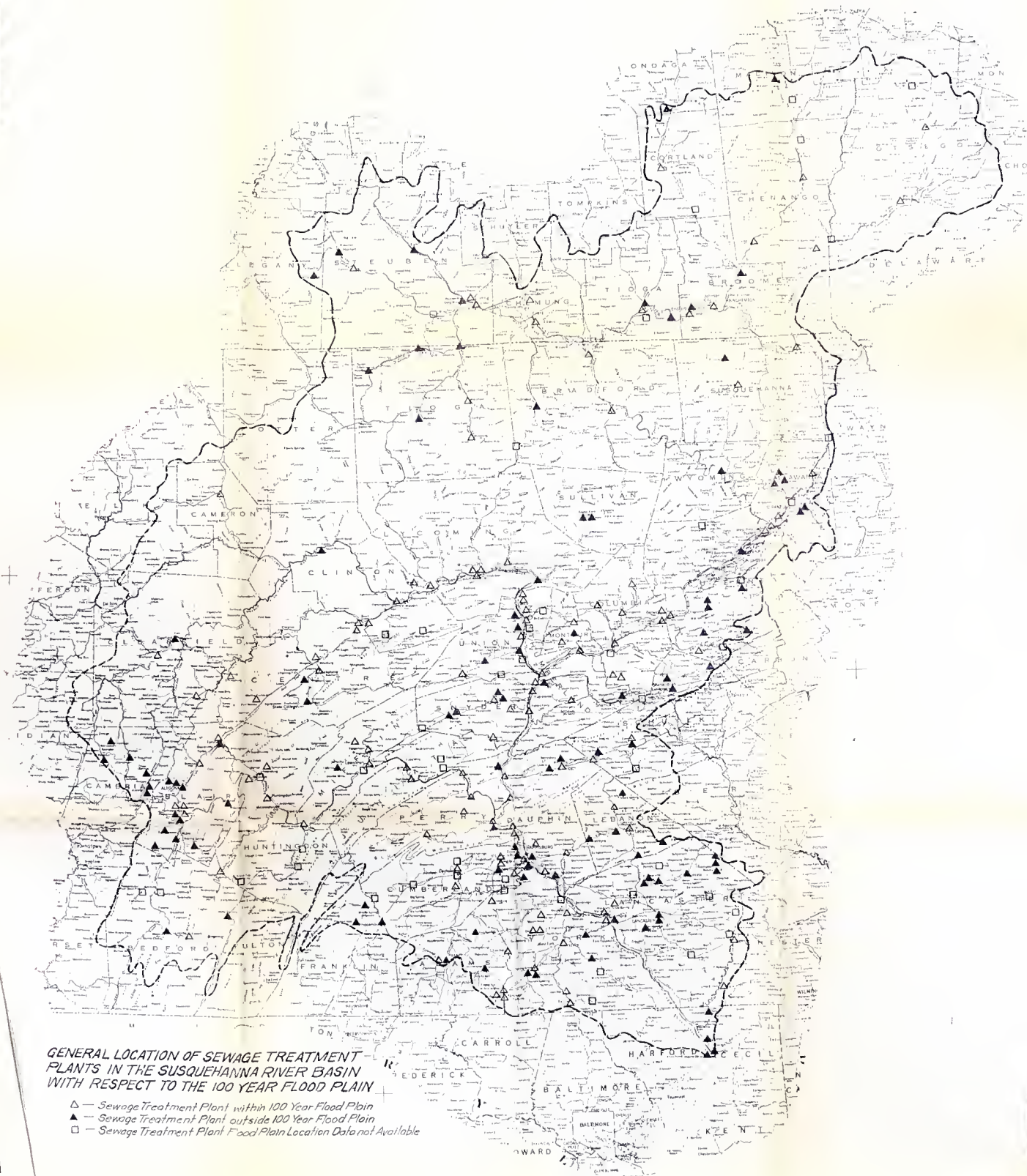
PROCEDURES FOR PRIORITIZING PROJECTS FOR THE REGULAR FLOOD INSURANCE PROGRAM

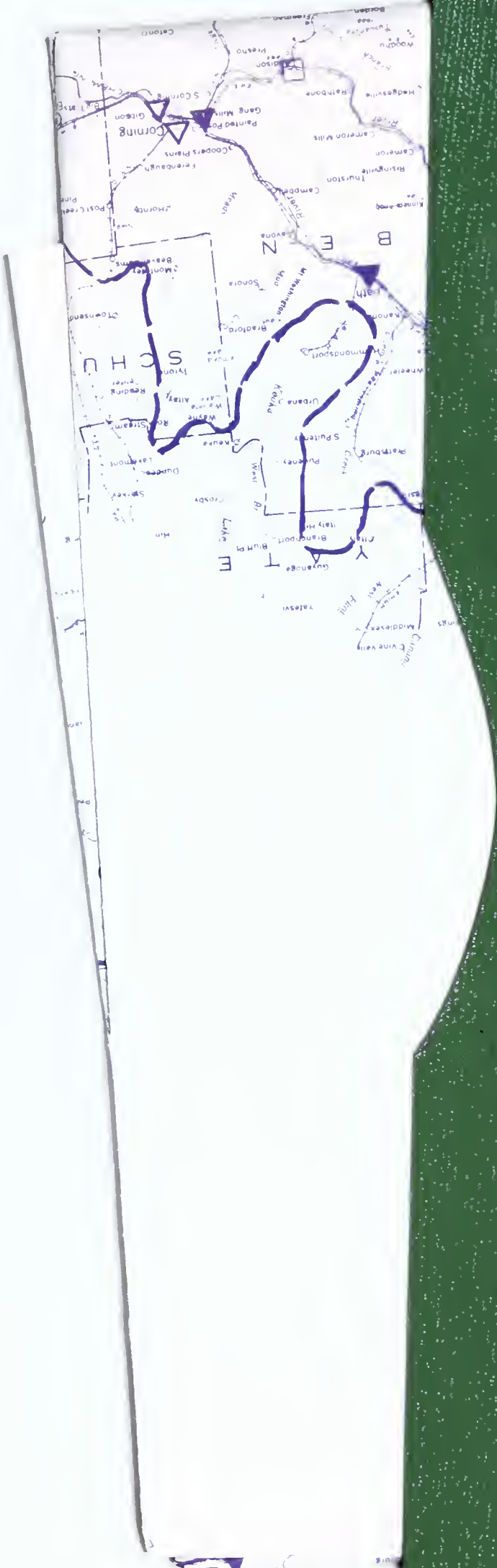
Annually, a meeting between HUD representatives and state coordinators is held. At this meeting various state/federal programs are discussed including the prioritizing of those areas (i.e. communities, basins) that have specific flooding problems. These various agencies then develop a priority list which outlines the areas where hydrological studies should be done within the next year to satisfy the requirements of the Regular Flood Insurance Program (RFIP). The reviewer in checking List No. 2, can ascertain whether the project is receiving the necessary priority to get the area into the RFIP as quickly as possible. If the area is not listed, and the reviewer feels that priority should be given to place the area on HUD's priority list then the reviewer should follow the procedures outlined below:

1. The reviewer should check to see if the area is located on List No. 2 and if not, he should determine whether the project should be placed on HUD's priority list. (NOTE: EPA should be selective in pursuing the placement of projects onto this priority list as the various agencies involved in the hydrologic studies have their own specific resource constraints).
2. If the reviewer feels the project warrants placement on HUD's priority list; the name of the project, location and supporting reasons (brief) should be submitted to the Section Chief.
3. Quarterly, a compiled list* will be sent by the Section Chiefs to the appropriate state coordinator and HUD's Regional Office (see the attached list of state/federal contacts).

It is envisioned that during the annual federal/state meeting adequate recognition will be given to the projects identified by EPA and that these projects will be placed on HUD's priority list and thus minimize flood damage and federal expenditures from flood loss.

*This procedure replaces the existing procedure of sending negative declarations to HUD.





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